

Appl. No.: 10/750,076
Amdt. Dated July 2, 2007
Reply to Office action of April 30, 2007

Amendments to the Claims:

1. (Currently Amended) A method for preparing an injectable formulation of biologically active interferon-beta (IFN- β) comprising:
 - a) preparing a first solution comprising biologically active IFN- β , isolating a pool of purified biologically active IFN- β from this solution, and precipitating said IFN- β from this pool using an alcohol to form a precipitate;
 - b) dissolving said precipitate in guanidine hydrochloride (HCl) to form a second solution comprising resolubilized denatured IFN- β and guanidine HCl;
 - c) diluting said second solution into a first buffer to obtain a third solution comprising resolubilized renatured IFN-beta and residual guanidine HCl; and
 - d) removing residual guanidine HCl from said third solution by diafiltration or dialysis of said third solution into a second buffer that is pharmaceutically acceptable, wherein said first buffer has a pH of about 5.0 to about 8.0, and wherein said residual guanidine HCl is present in said third solution at a concentration of 1.6 M or less, whereby said injectable formulation of IFN- β is prepared.
2. (Original) The method of claim 1, wherein said second buffer contains arginine or sodium chloride.
3. (Canceled)
4. (Original) The method of claim 1, wherein said IFN- β has the amino acid sequence set forth in SEQ ID NO:1 or SEQ ID NO:2.
5. (Previously Presented) The method of claim 1, wherein said IFN- β is glycosylated.
6. (Original) The method of claim 1, wherein said IFN- β is recombinantly produced.

7. (Previously Presented) The method of claim 1, wherein said IFN- β has at least 80% amino acid sequence identity with the amino acid sequence set forth in SEQ ID NO:1 as calculated using the ALIGN program (version 2.0) with a PAM 120 weight residue table, a gap length penalty of 12, and a gap penalty of 4.

8. (Currently Amended) A method for preparing an injectable formulation of biologically active interferon-beta (IFN- β), said method comprising denaturation of biologically active IFN- β with guanidine hydrochloride (HCl) followed by renaturation of the IFN- β via dilution into a first buffer to obtain a renatured IFN- β solution comprising residual guanidine HCl, and removing said residual guanidine HCl from said renatured IFN- β solution by diafiltration or dialysis of said renatured IFN- β solution into a second buffer that is pharmaceutically acceptable, wherein said first buffer has a pH of about 3.0 to about 5.0, and wherein said residual guanidine HCl is present in said renatured IFN- β solution at a concentration of 1.6 M or less, whereby said injectable formulation of IFN- β is prepared.

9. (Canceled)

10. (Currently Amended) The method of claim [[9]] 8, wherein said first buffer has a pH of about 3.0 to about 4.0, and wherein said residual guanidine HCl is present in said renatured IFN- β solution at a concentration of 0.2 M or less.

11. (Original) The method of claim 10, wherein said first buffer has a pH of about 3.0, and wherein said residual guanidine HCl is present in said renatured IFN- β solution at a concentration of 0.1 M or less.

12. (Original) The method of claim 8, wherein said IFN- β has the amino acid sequence set forth in SEQ ID NO:1 or SEQ ID NO:2.

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13. (Previously Presented) The method of claim 8, wherein said IFN- β is glycosylated.

14. (Original) The method of claim 8, wherein said IFN- β is recombinantly produced.

15. (Previously Presented) The method of claim 8, wherein said IFN- β has at least 80% amino acid sequence identity with the amino acid sequence set forth in SEQ ID NO:1 as calculated using the ALIGN program (version 2.0) with a PAM 120 weight residue table, a gap length penalty of 12, and a gap penalty of 4.

16. (Currently Amended) A method for preparing a composition comprising substantially monomeric biologically active interferon-beta (IFN- β), said method comprising:

- a) preparing a precipitate of substantially purified biologically active IFN- β ;
- b) dissolving said precipitate in guanidine hydrochloride (HCl) to obtain a first solution comprising resolubilized denatured IFN- β ; and
- c) renaturing said IFN- β by dilution of said first solution with a buffer solution, wherein said buffer solution has a pH of about 5.0 to about 8.0.

17. (Canceled)

18. (Original) The method of claim 16, wherein said IFN- β has the amino acid sequence set forth in SEQ ID NO:1 or SEQ ID NO:2.

19. (Previously Presented) The method of claim 16, wherein said IFN- β is glycosylated.

20. (Original) The method of claim 16, wherein said IFN- β is recombinantly produced.

21. (Previously Presented) The method of claim 16, wherein said IFN- β has at least 80% amino acid sequence identity with the amino acid sequence set forth in SEQ ID NO:1 as calculated using the ALIGN program (version 2.0) with a PAM 120 weight residue table, a gap length penalty of 12, and a gap penalty of 4.

22. (Currently Amended) A method for preparing an injectable formulation of biologically active interferon-beta (IFN- β), said method comprising:

- a) obtaining a sample comprising substantially purified biologically active IFN- β ;
- b) mixing said sample with guanidine hydrochloride (HCl) to obtain a first solution comprising solubilized denatured IFN- β ;
- c) diluting said first solution into a first buffer to obtain a second solution comprising solubilized renatured IFN-beta and residual guanidine HCl; and
- d) removing residual guanidine HCl from said second solution by diafiltration or dialysis of said second solution into a second buffer that is pharmaceutically acceptable, wherein said first buffer has a pH of about 3.0 to about 5.0, and wherein said residual guanidine HCl is present in said second solution at a concentration of 1.6 M or less. whereby said injectable formulation of IFN- β is prepared.

23. (Canceled)

24. (Currently Amended) The method of claim [[23]] 22, wherein said first buffer has a pH of about 3.0 to about 4.0, and wherein said residual guanidine HCl is present in said second solution at a concentration of 0.2 M or less.

25. (Original) The method of claim 24, wherein said first buffer has a pH of about 3.0, and wherein said residual guanidine HCl is present in said renatured IFN- β solution at a concentration of 0.1 M or less.

26. (Original) The method of claim 22, wherein said IFN- β has the amino acid sequence set forth in SEQ ID NO:1 or SEQ ID NO:2.

27. (Previously Presented) The method of claim 22, wherein said IFN- β is glycosylated.

28. (Original) The method of claim 22, wherein said IFN- β is recombinantly produced.

29. (Previously Presented) The method of claim 22, wherein said IFN- β has at least 80% amino acid sequence identity with the amino acid sequence set forth in SEQ ID NO:1 as calculated using the ALIGN program (version 2.0) with a PAM 120 weight residue table, a gap length penalty of 12, and a gap penalty of 4.

30. (Currently Amended) A method for preparing a composition comprising substantially monomeric biologically active interferon-beta (IFN- β), said method comprising:

- a) preparing a sample comprising substantially purified biologically active IFN- β ;
- b) mixing said sample with guanidine hydrochloride (HCl) to obtain a first solution comprising solubilized denatured IFN- β ; and
- c) renaturing said IFN- β by dilution of said first solution with a buffer solution, wherein said buffer solution has a pH of about 3.0 to about 5.0.

31. (Canceled)

32. (Original) The method of claim 30, wherein said IFN- β has the amino acid sequence set forth in SEQ ID NO:1 or SEQ ID NO:2.

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33. (Previously Presented) The method of claim 30, wherein said IFN- β is glycosylated.

34. (Original) The method of claim 30, wherein said IFN- β is recombinantly produced.

35. (Previously Presented) The method of claim 30, wherein said IFN- β has at least 80% amino acid sequence identity with the amino acid sequence set forth in SEQ ID NO:1 as calculated using the ALIGN program (version 2.0) with a PAM 120 weight residue table, a gap length penalty of 12, and a gap penalty of 4.